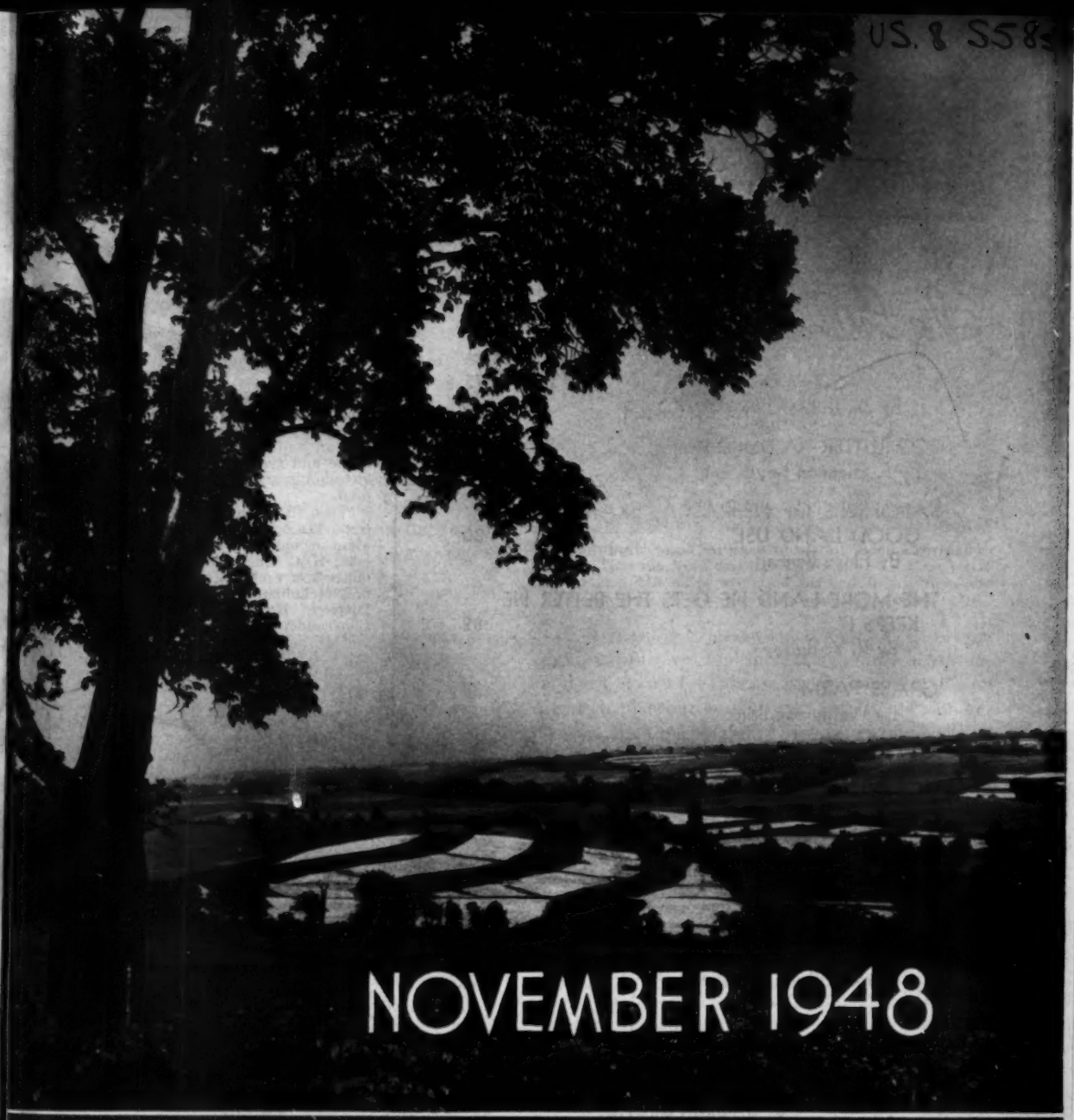
U.S. 8 S58



NOVEMBER 1948

SOIL CONSERVATION

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

SOIL CONSERVATION •

NOVEMBER - 1948
VOL. XIV - NO. 4

CHARLES F. BRANNAN
SECRETARY OF AGRICULTURE

HUGH H. BENNETT
CHIEF, SOIL CONSERVATION SERVICE

ISSUED BY SOIL CONSERVATION SERVICE, U. S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D. C.

In this Issue—

	Page
WHY WASTE WOOD? By A. C. McIntyre	75
BOB RUTTER—A District Profile By F. Glennon Loyd	79
SANDHILLS OF NEBRASKA, EXAMPLE OF GOOD LAND USE By Hugh Bennett	80
THE MORE LAND HE GETS THE BETTER HE KEEPS IT By R. Y. Bailey	82
GRASS FARM By Wellington Brink	84
REPORTS FROM THE DISTRICTS	
Pacific	88
Southwest	90
Northern Great Plains	92
Western Gulf	93
Upper Mississippi	94
Southeast	94
RESEARCH POINTERS Prepared by J. H. Stallings	96

WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with approval of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

10 CENTS PER COPY **$1 PER YEAR**
FOREIGN—$1.50 PER YEAR
25 percent discount on orders of 100 or more subscriptions mailed to a single address

A CRIME INDEED!—The McLennan County, Tex., grand jury recently made the newspaper headlines in Texas by submitting an oral report labeling soil erosion a crime and recommending that the county buy equipment to help farmers protect the land.

When the grand jury met in the county seat, Waco, one of the jurors, Herbert Manske, obtained permission of the foreman, H. C. Buchanan, to discuss the seriousness of erosion in his precinct, county, and McLennan County Soil Conservation District. He said that it seemed as though the county commissioners were concentrating on the maintenance of roads but emphasized that there would be little need of the roads if something was not done immediately to conserve the soil.

Upon request, the district attorney advised the grand jury that it was within its jurisdiction to declare soil erosion a crime. Impressed by this unusual action, the attorney notified the Waco News-Tribune. As a result, a detailed story was published on the front page. Put on press association wires, the story was carried also by other Texas newspapers.

USEFUL MAGAZINE.—"May I add that SOIL CONSERVATION very frequently supplies me with valuable material serving as a basis for articles?" writes a columnist for the Habana newspaper *INFORMACION*.

THE COVER.—Strip cropping on the Spoon Creek watershed of the Coshocton County Soil Conservation District, Ohio. Parts of five farms are seen. They belong to Ray Tomlin, John Lavray, William Rogers, O. R. Laymon, and Gerald Hamilton. Photographer is Hermann Postlethwaite.

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

WHY WASTE WOOD?

By A. C. McINTYRE

WHY ARE not sawdust and wood chips more generally used as direct aids to soil conservation?

Are conservationists, agronomists, soil scientists, foresters, and farmers bypassing wood as a direct contributor to soil husbandry?

A good answer to the first question might also answer the second.

Wood is organic matter—cellulose and lignin—and our soils, of course, need organic matter. Productivity and resistance to erosion have been correlated to the percentage of humic material soils contain. Infiltration rates and water-holding capacity are influenced by organic matter. Mulching has a place in soil husbandry but availability of materials, and costs, are limiting factors to its general adoption as a regular farm practice.

NOTE.—The author is chief, regional forestry division, Soil Conservation Service, Upper Darby, Pa.

Chadbourne stands before one of the numerous piles of chips and sawdust to be found on the farm.

Custom-built wood chipper operating near Providence, R. I. This machine can handle trees up to 5 inches in diameter. The chips are good for bedding, mulch, and incorporation in the soil as organic matter.

Is it feasible to use wood directly as a soil organic supplement and have it available in volume and at low cost for this use and as a mulch? There are two places to go for answers: reports on research, and the experience of farmers, orchardists, and gardeners.

Researchers have had an exploratory interest in the agronomic value of sawdust, but most of their studies have been limited. More work seems to have been done in European countries than in the United States. Many reports on studies of organic matter give passing comment on wood or sawdust, and there is considerable contradiction. Separating fact from mere rationalizing is not always possible. Legends recounting "ill" effects of wood seem to have a strong hold on the minds of farmers and certain writers.

In assessing potentials in the use of wood it is necessary to consider several accepted values of organic matter, recently summarized by Bear (1):

It serves as food for various types of desirable soil micro-organisms.

It supplies essential elements for reuse by succeeding plants.

It aids in improving the physical qualities of soils.

Its presence as living or dead material on or in the soil aids in the control of erosion by wind and water.

805823—48

In mulch form it increases water intake, reduces water loss, lowers soil temperature.

Many other more or less obscure values may be assigned to organic matter. The possibility exists that plant-stimulating hormones are released during its decay. Farmers believe it has crop-insurance value, both in getting young seedlings through the soil crust and in protecting plants against various other adversities.

The chemical composition of wood is slightly variable, depending on tree species. It can be generally accepted as an organic substance composed of 60 percent lignin and 40 percent cellulose, with some waxes, tannins, and resins. As a fertilizer, fresh sawdust is in the same class as straw, hay, or corn fodder, all of whose N–K–P values fall about 4–4–4. The average for wood is estimated at 3–2–4.

Several comprehensive studies have been made on the value of wood as organic matter. Viljoen and Fred (2) studied the effects of different kinds of wood on the growth of oats and clover. They found the unfavorable action of wood on plant growth was due to a lack of nitrate in the soil. Using wood-pulp cellulose as a check, the same results were obtained as with wood. They concluded it was unlikely there is any toxic action on plants due to such wood constituents as oils, resins, and tannins. They found the lack of nitrate due to a reduction rather than an inhibition of nitrification, and this reduction was caused by a group of organisms that make use of cellulose. (The same organisms and nitrogen deficiencies appear when other organic materials decompose.) Their work appears to have established that the reduced growth of plants following the application of wood is closely connected only with a loss of nitrate and that this injury soon passes off and is almost without effect the following season.

Turk (3) drew similar conclusions. "Experiments . . . all indicate that the depressive action of sawdust on plant growth is the result of a deficiency of soluble nitrogen . . . in soils higher in nitrogen, no depressive effect is likely to occur . . . well rotted sawdust usually has no detrimental effect."

Butterfield (4) reports: "If sawdust is supplemented with some readily available source of nitrogen, it can be added to soils without fear of harmful effects. In all the greenhouse experiments, nitrogen, whether in the form of dried blood, inorganic nitrogen, or manure, overcame

Strawberry field mulched with chips and sawdust. There are no weeds here.

the detrimental (nitrogen grab) influence of sawdust. . . . nitrogen added in sufficient quantities to give the sawdust the equivalent of about 2 percent N will overcome the detrimental effects of the sawdust in soils very low in available nitrogen." Turk (3) said, "On the average, perhaps one-third of a pound of ammonium sulphate per cubic foot of fresh sawdust will meet the nitrogen demand. . . . 500 pounds of ammonium sulphate should be used with each 10 tons of dry sawdust."

Midgley (5) found that shavings and sawdust supply active energy material and raise the temperature of manure to the same extent as does mature hay. The wood acts like other carbonaceous materials.

Wood does not produce excessive soil acidity. Pine or other softwood sawdust contains less basic material than that from hardwoods. Upon decay most of the organic acids are used by organisms or lost into the air, leaving a neutral or alkaline residue. Sawdust from tree species like oak contains large amounts of tannins and terpenes but the latter seldom hold over in soil because soil organisms destroy them. Data indicate that pH will be affected by not more than two-tenths. Locally recommended liming programs will suffice to meet requirements.

These studies and others lead to the conclusion that wood itself does not produce a toxic soil condition, and the incorporation of fresh wood in the soil results in a nitrogen grab that is reflected in decreased plant growth. If the nitrogen requirement is met, no depressive effects will be observed. Research on nitrogen requirements under varying conditions of size of wood fragment, or physical nature of soil medium, is lacking. Studies seem to establish that if nitrogen is added with the wood,

beneficial effects, as measured by crop yields, will occur.

It is accepted that a beneficial physical effect accrues to soils by mixing sawdust with them. Adding sawdust to heavy soil has improved its structure, as reflected by ease of tillage and infiltration rates. Aeration is improved. Sawdust and shavings have a high water-absorbing capacity and contribute this quality to both heavy and sandy soils. One pound of sawdust can absorb

Chadbourne employs boys and girls to pick beans. He picks up the youngsters in his truck; allows them an hour and a half for lunch, which gives them time for a swim in the lake; takes them home in the afternoon.

two to four times its own weight; shavings about twice their weight.

While there is no reported research on the use of chips—small fragments or wood chunks—it is reasonable to assume the incorporation in soil of wood in any form will improve its physical properties.

There is no reason to assume that wood could not make as great a contribution to the control of wind and water erosion as many other sources of humus material. It is well established that there is a direct correlation between the erodibility of a soil and its organic matter content. One of the values of a crop rotation is to maintain or build up the percentage of organic matter. Wood, readily available in the woodlots of thousands of farms, might be used to aid conservation programs.

Sawdust and shavings have been used as a mulch. They have given the same beneficial effects—increased water intake, reduced water loss, and low soil temperature—as have other organic materials. It has been observed that sawdust is easily washed or blown away; shavings remain in place much better. No research is reported on use of chips or fragments, which are probably the best form for wood mulch.

Many farmers and orchardists have used sawdust and shavings with excellent results. Both research and practical experience have established the value of sawdust and shavings as bedding material. As absorbents they are about equal to chopped straw and twice as effective as unchopped wheat straw. For balance, about 50 pounds of 20 percent superphosphate per ton of manure should be added. Trial plot studies comparing sawdust manure with that of straw manure have repeatedly returned equal or greater yields on the sawdust plots. Farmers who have used sawdust or shavings for many years report that soil health has improved and crop yields increased.

Use of sawdust on the Barkdoll (6) and Chadbourne (9) farms has made a major contribution to the agronomic and economic successes these two farmers enjoy. Of particular interest are the memories of Barkdoll's neighbor Geesaman (6), who, after helping with the harvest, found sawdust, not soil, in his shoes. The quantities of sawdust used were such as to fill the soil and remain on top as a mulch in the corn fields. Sawdust covers the soil of the pastures. For more than 30 years sawdust in great quantities has been used. There are no toxic conditions to be observed as a result.

Several years ago a vegetable grower, W. P. Starkey of Buck Hill Falls, Pa., leased a large acreage of scrub oak forest land in north central Pennsylvania. The scrub oak was typical of the type. Fire had occurred repeatedly at about 5-year intervals. The soil was a sandy loam, recognized as droughty. Removing only large stumps and scattered pitch pine stems having a diameter greater than 3 inches, the operator disked and plowed all woody material directly into the soil. Analysis indicated a soil organic content of about 10 percent. A thousand pounds of 4–8–6 per acre each year has returned excellent yields of snap beans, and two crops of spinach. A neighbor, observing results, has plowed down several hundred acres of scrub oak. His soil tests indicated that more than 8 percent organic matter had been cut into the soil. A half ton of lime and 500 pounds of cyanimide returned a "grand yield of potatoes." Last year a thousand pounds of 5–10–10 was applied and again a good crop of potatoes

resulted. This year a new 100-acre field was added. Standard equipment was used—a two-row planter and unmodified digger. Chunk wood and scrub oak stumps, of course, did slow up machine work. The operations deserve study because wood was used directly as an organic soil supplement.

Berry growers have used sawdust and shavings with good results. Farm journals contain many interesting success reports. Orchardists have used sawdust and chips as mulch, and repeated use has established values. There is interest in a report (10) on the use of fir sawdust as a mulch in a pear orchard. Heavy soils were creating a problem of water intake. A yearly dressing of 3 inches of sawdust, and disking under with a cover crop of rye and a legume, resulted in "fine yields, good water penetration and the saving of irrigation." Soils men checked the soil structure and found a great improvement in tilth that increased with the age of the treatment. Fertilizer was used at the rate of 200 pounds of N in three applications and 100 pounds of P_2O_5 in a fall application to stimulate the legume cover crop.

Is empirical research ahead of planned research? If wood is making a real contribution to the farming practices of a few, can it not also aid others? Of course, economics and costs must be considered. Millions of tons of sawdust are wasted. Sawmill men usually find sawdust and shavings a costly handling item and welcome removal. A few mills have installed "hoppers" as an invitation to farmers to remove it. However, if agriculturists were to advocate the use of sawdust, or more farmers learn by trial that wood can contribute to farming, there would not be enough sawdust to meet the demand. Because of demand for shavings as bedding in some areas, they are competitively priced. Volume is largely dependent on planing mill operations. A few mills have installed hogs or hammer mills for the conversion of lumber waste into bedding materials. Again volume is limited.

Light portable wood chippers are available. Designed to convert chunk or pole wood into chips acceptable for bedding, these machines are being used in the wood lots to produce pulpwood chips.

A study (7) of production of hogged wood for fuel in 1942 indicated that pole wood in 8- to 12-foot lengths could be converted to chips at a cost of $1.15 a cord. It is estimated that today's cost would be about $2. This includes all items of conversion from the pole pile to the mound of chips. A cord of wood weighs about 2 tons. Thus, the cost of converting chunk wood to chips would be $1 per ton. A comparable cost figure was arrived at (8) in Rhode Island. In this case for $1 per ton a chip was produced about the same size as that of wood fragments being used for bedding. The cost of getting out chunk wood should not exceed $2 per ton. Such wood should come from small tops and other polewood logging debris, and particularly from woodland thinnings.

It is recognized that woodland is producing at least 2 tons of wood per acre (cellulose and lignin, organic matter) each year. If this wood is not harvested from normally stocked woodland, it is lost to farmer use. It can be harvested without reducing productive capacity. Census data show that in most States east of the Mississippi about 25 percent of farm land is woodland. Thus there would be available each year per average farm about 50 tons of wood that might be converted to chips and used as mulch, bedding, or added directly to the soil. This might be an answer to the question so often asked by foresters: "Where is there a market (or use) for low grade material in wood lots that should be removed to improve growing stock, and how can logging waste be economically utilized?"

REFERENCES

(1) Bear, Firman E. The Real Values of Soil Organic Matter. Journal of Soil and Water Conservation. Volume 1, No. 2, 1946.

(2) Viljoen, J. A., and Fred, E. B. The Effect of Different Kinds of Wood and of Wood Pulp Cellulose on Plant Growth. Soil Science. Volume 17, No. 3, 1924.

(3) Turk, L. M. The Effect of Sawdust on Plant Growth. Michigan Agricultural Experiment Station. Quarterly Bulletin 26, No. 1, 1943.

(4) Butterfield, H. M. The Effect of Sawdust on Plant Growth. Calif. Hort. Soc. Volume 1, No. 1, 1944.

(5) Midgley, A. R. The Use of Sawdust, Shavings and Superphosphate with Dairy Manure. Northeastern Wood Utilization Council Bulletin No. 7, 1945.

(6) Geesaman, D. W., and Norris, F. G. Dairy Farming with Sawdust. American Forests, Volume 49, No. 4, 1943.

(7) Bratton, A. W. The Production of Hogged Wood from Connecticut Hardwoods. Northeastern Forest Experiment Station. Technical Notes, No. 41, 1941.

(8) Albright, Russell L. Report to the author, 1947.

(9) New England Homestead, July 1948.

(10) Hockensmith, R. D. Memorandum, June 1948.

DISTRICT PROFILE

BOB RUTTER

Cattleman

R. L. (Bob) Rutter, Jr., is a fast-moving, blunt-spoken cattleman from the rodeo city of Ellensburg, Wash., where everybody knows his twin loves are Aberdeen-Angus cattle and soil conservation.

Son of a pioneer Spokane banker, and with a trace of Indian blood in his veins, Bob has lived on the same irrigated farm northeast of town for the last 35 years. He parts his black hair in the middle, and his dark eyes are surrounded with "laugh" wrinkles.

Bob is pretty busy. He's chairman of the Kittitas Soil Conservation District. He helped organize and served two terms as president of the Washington State Association of Soil Conservation District Supervisors. In addition, he was a member of the organizing committee and the first vice president of the National Association of Soil Conservation Districts.

Just now he is serving a freshman term as State senator, and is a member of the Joint Legislative Interim Committee on Un-American Activities in the State of Washington.

Until he filed for office he was president of the Kittitas County Farm Bureau, which he helped organize a quarter century ago. Bob also has been a director of the Washington State Farm Bureau and a member of its soil conservation committee. While he was in the turkey business a few years ago, he was vice chairman of the American Farm Bureau's Poultry Committee.

He's on the executive committee of the Washington Taxpayers' Association, a member of the board of directors of the Washington State Reclamation Association, and a commissioner of the Ellensburg Housing Authority. He is a director of the Washington Cattlemen's Association. During the war he was chairman of the Kittitas County Selective Service Board.

Bob changed from dairy cattle to beef several years ago. Until recently he owned a show herd of blacks of the famed Rosemere strain. He sold the show herd because he hasn't the time to spend with it. He has a commercial herd of grade Angus cows and purebred sires.

Bob has revamped his irrigation to gain greater efficiency and better drainage. He also has enjoyed excellent results with improved pastures and native grass pastures which he fertilizes each year. Bob runs all his cattle on irrigated pastures. He does not own or lease any range.

The Kittitas Soil Conservation District, organized in 1942, was the first district in the State to sponsor, guide, and reward a conservation 4–H club. The district's 40-acre demonstration pasture is attracting a lot of attention. It was stocked with 100 cattle most of the season to keep it grazed properly. It has shown the potentialities of using gravelly Class III and IV lands properly.

Bob's wife, Mable, really keeps the ranch going. Mrs. Rutter, gracious, energetic, and a gifted pianist, shares her husband's enthusiasm for soil conservation. They have two sons and a daughter.

Robert L. 3d, the oldest, was a lieutenant commander in the Navy and now is manager of Radio Station KXLJ, Helena, Mont. Gale served in both the Navy and the merchant marine and now is at Harvard University. Olive, their daughter, is at home. Bob hopes that one of the boys, after some seasoning in the business world, will return to the farm to take over active management.

You don't have to be around Bob long till you find out why he's enthusiastic about soil conservation districts and the work they are getting done everywhere.

(Continued on page 81)

SANDHILLS OF NEBRASKA, EXAMPLE OF GOOD LAND USE

By HUGH BENNETT

THE SANDHILLS of central Nebraska are beautiful in this mid-August forenoon sunshine. For hours I have been enjoying the uninterrupted loveliness of the landscape from a train.

As far as the eyes can see, the entire area is brilliantly verdant in the luminous sun. Everything but the lakes is densely and refreshingly clothed with the greenest of grass. And the lakes nestled in the dimpled depressions among the dunes and meadows are as crystal-clear as rainwater.

There were wild ducks on many of the lakes the morning I jotted down these observations. And there were various other water birds about those flashing pools of sand-filtered water; among them blackbirds, gulls, killdees, and white herons. Mallards and small ducks were rather plentiful. Some put to flight as our train passed by; others skimmed away, plowing out diminutive furrows across the surface of the water. Some stood motionless, apparently having become accustomed to the train as a harmless monster.

White-faced cattle grazed contentedly in groups of small and medium size, scatteringly or in compact formation. It was cool enough for the calves to be frolicsome.

Here in the Nebraska sandhills the country has not been greatly disturbed by man, although extensively and rewardingly used. It is still grass-covered, much as it was, probably, soon after the close of the Ice Age. And that is the point of this article.

These Nebraska sandhills I have long thought of as the best example of sound land use that we have on any very large scale in America. The area is used almost exclusively for grazing. Some hay is cut for winter feed from the low flats where grass normally grows luxuriantly. Everywhere, practically, the grazing lands are used according to carrying capacity. An occasional small garden is seen in places protected from soil blowing by the local surface configuration.

For the most part, Nebraska farmers have had the good sense to do two very wise things in their use of these sandhills: First, they have kept the number of cattle safely within the grazing capacity of the land; second, measures are promptly taken to prevent blowing wherever the sod is broken through to sand by concentrated trampling around water holes and along cattle trails.

Even in times of high prices for beef, as at present, these Nebraska ranchers rarely overstock the range. I think they must have learned long ago that overgrazing exposes the loose sand that lies immediately beneath the grass. Under the trampling of excessive numbers of cloven-hoofed animals, the grass sometimes is cut to pieces in just the right way to start blowouts—wind erosion that is not too easy to stop if allowed to run along without attention. I suspect, too, they have learned from experience that while there is plenty of grass in years of good rains to hold everything soundly together, droughts do come along now and then in sufficient severity to weaken plant growth and put the land in just the right condition for wind erosion where there is any overgrazing.

In other words, the land users of the sandhills of central Nebraska have been seeing and understanding the capacity of their grazing lands, and acting accordingly. They have come to know that sandy land bared of protective vegetation is dangerous to have around a ranch. And, to their very great advantage, they have learned to cooperate with Nature in order to keep the land permanently productive.

Concentration of cattle does sometimes break the turf and start blowing and even some local washing of the soil. But the bared areas are not permitted to spread. Without too much delay, they are plastered all over with manure or old hay, or they are seeded to appropriate protective crops, including, as you might suspect, adaptable grasses.

To look at this country, you wouldn't think the ranchers would be especially interested in soil conservation. But they are, and very much so! Not only are they good users of land, they are thoroughly progressive people otherwise. They want and demand the full advantages of progress—the best that man has been able to garner from research and experience. If there are better grasses, they want to try them; and if the trials prove successful, the directors of the local soil con-

There is comforting goodness in the greenness of the grass, the sunny skies, and the fat cattle of central Nebraska's landscape.

servation district are sure to be called on for the assistance of the Soil Conservation Service technicians assigned to the district in getting seed supplies and in planting in the right way, at the right place, at the right time.

That is as it should be. It means even better use of the land than just good average use, such as you can find over much agricultural land in many localities. And it means fat cattle, good calf crops, good income, contentment—and land safeguarded for permanent use.

Life is really worth living in this great area of summer verdancy. And I wonder if there isn't some fishing, too, in some of those shining blue lakes?

BOB RUTTER

(Continued from page 79)

"We district supervisors," he said not long ago, "take pride in the fact that our type of assistance increases the individual farmer's responsibility in seeing that his land is used properly.

"The soil conservation district program goes a long way to increase the farmer's sense of responsibility for husbanding his land. This is in contrast with some other programs which I feel serve mainly to demoralize him and weaken his responsibility to our Nation."

It is easy to understand Bob's philosophy when you read a tablet on a boulder on Swan Island, where hundreds of ships were built during the war.

The tablet, entitled "The Spirit of American Enterprise," was placed there in 1941 by the Oregon Historical Society. It says: "The 'Star of Oregon,' first sea-going ship built in Portland, was launched here May 19, 1841, through the courage and foresight of those daring pioneers, Capt. Joseph Gale, Pleasant Armstrong, Ralph Kilbourn, Jacob Green, John Canan, aided by Capt. Charles Wilkes, U. S. N., Felix Hathaway, Thomas J. Hubbard. This project brought great benefits to the settlers of the Oregon country . . ."

The Capt. Joseph Gale mentioned in the tablet was Bob's great grandfather on his mother's side.

—F. Glennon Loyd.

805823—48—2

The MORE LAND HE GETS the Better He Keeps It

They're justly proud of this young peach orchard: Dave Yarbrough (left), Lewis Avant (Dave's son-in-law), and Harry Yarbrough.

By R. Y. BAILEY

FROM SHARE CROPPER in 1908 to owner and efficient operator of 12,000 acres is a long step. That is the 40-year achievement of Dave L. Yarbrough, chairman, board of supervisors, Central Alabama Soil Conservation District.

Yarbrough, who lives on his farm near Prattville, is not a large land owner of the type who makes money in other business and buys all of the acreage he can get. He is an active farmer who began as a share cropper in 1908, was a full renter (he then owned his own work stock) in 1909, and bought his first 60 acres in 1910. Few years have passed since 1910 that he failed to buy additional land.

Yarbrough is vice president of a bank, operates a large hardware business in town, and he and his son, Harry, run an automobile agency in Prattville, and other kinds of business. Unlike most businessmen-farmers, the Yarbroughs are farmer-businessmen. Their primary interest is in the land where they got their start. They live on the land and have others handling the details of their town business, whereas, most businessmen bought land with profits from their town or city business enterprises and have someone else living on and looking after the land.

Ownership of so much land entails certain obligations to the land and to the people who live on it. While riding over a portion of his home place early one April morning, Dave Yarbrough showed me some of the things he was doing for the land and told me a few stories that gave me insight into

NOTE.—The author is chief, regional agronomy division, Soil Conservation Service, Spartanburg, S. C.

his relations with the people who live on his land.

A steep slope with a beautiful stand of loblolly and slash pine growing on it was one of our interesting stops on this spring morning. Standing on a high place overlooking the pine-covered slope, Yarbrough said, "I planted these trees the year after the cotton plow-up. I plowed up cotton here on this steep land in 1933. I've planted 5,000 to 10,000 pine trees every spring since then." This first planting of pine trees was a beginning of better land use.

Timber cut from their own land has been used in building houses for each of Yarbrough's children who chose to settle on the land. Each one received a modern new house as a wedding present. These houses were built on land deeded to them at the time of their marriage.

When the Central Alabama Soil Conservation District was organized in 1940, Dave Yarbrough became a member of the board of supervisors representing his county, Autauga. With the assistance of Soil Conservation Service technician Bill Aiken, Yarbrough developed a soil and water conservation plan. It provided for the conversion of steep slopes to adapted perennial vegetation. Some of this cover was additional pine trees on slopes that were steep and eroded, or were so located that trees were the most desirable kind of cover. Other steep land was planted to kudzu and sericea lespedeza, both of which are used for pasture.

Hundreds of acres on which cotton formerly grew have been recognized as being too steep for safe and profitable cultivation and are now covered with sericea, kudzu, or pine trees. When the acreage he owns is taken into account, the progress Dave Yarbrough has made toward getting all of his open land that is too steep for cultivation under protective perennial cover is a remarkable achievement.

The land on moderate slopes that remains in cultivation is terraced and cultivated on the contour. It is part of the plan for all cultivated land to be under cover each winter. This goal has been met on the home place and is being approached on outlying tracts. All of the winter cover crops are seeded with seed harvested on the Yarbrough farm.

Winter cover crops of reseeding crimson clover (Autauga County strain), vetch, and blue lupine are used. Crotalaria is one of the summer legumes that is well-liked. This legume grows as a volunteer after oats and after the last cultivation of corn.

Cotton, corn, and winter vegetables are the principal cash crops from the cultivated land. The city of Montgomery, 9 miles away, is a good winter market for such vegetables as turnips, mustard, and collards.

Hogs and beef cattle are the principal livestock enterprises. Both classes of livestock get a large part of their winter feed from oats and crimson clover. Crimson clover is especially valuable as a winter and spring pasture for brood sows. Local hog farmers swear by crimson clover as the best milk-producing green feed for brood sows. They place crimson clover above all other kinds of green feed for this class of livestock.

Autauga County has a local strain of reseeding crimson clover believed to be the best in the field. It was only when he was discussing the superior merits of this local strain of crimson clover that I heard Dave Yarbrough raise his voice above normal conversational tone. He did so to emphasize his belief in this plant that is doing so much as a protective ground cover, winter and spring grazing, and green manure crop.

Kudzu is an important summer pasture for hogs and cattle, and sericea lespedeza is a major grazing crop for cattle on the Yarbrough holdings. Both are used on steep uplands not suitable for other pasture plants. Lowland pastures of Dallis grass and white clover form one of the major parts of the grazing program.

It is an accepted fact on this farm that all kinds of pastures, sericea, kudzu, winter legumes, and lowland grass and clover must be limed and fertilized. Dave Yarbrough is not one of those optimists who believes he has found crops that will grow on poor soils without being fed. He is a regular and liberal user of fertilizer.

Earlier, I mentioned the relationship between Yarbrough and the people who live on his extensive holdings. This can best be told by relating one or two stories he told me while we were looking over some of his land. When I asked how often his tenants moved, he said, "I have tenants who have been with me since 1914." To these long-time tenants he is either "Cap'n" or "Mr. Dave." Both white and colored tenants respect his judgment and consider him a "good man to live with."

(Continued on page 86)

The freshly wilted grass is chopped and blown into the silo. Salt is added to preserve the mixture and add flavor.

Grass Farm

By WELLINGTON BRINK

C. T. RICE grows grass. He has the greenest farm I have ever seen. Seventy of his 90 acres are cleared. Last year those 70 acres yielded all the pasture his 35 Guernsey cows could use *plus* 130 tons of grass silage *plus* all the hay needed for winter *plus* 40 tons of hay for sale.

For many years milk production has averaged 9,500 pounds per cow; butterfat, 420 to 450 pounds. Milk sales have run $16,400 to $18,326 every year since 1940.

C. T. Rice purchased his farm in 1915. He knew land and cattle, and he had high respect for planning and management. He had attended Pennsylvania State College, then served the Southern Railway several years as dairy-development agent.

When he bought his place near Oakton, in northern Virginia, it was mostly brush, trees, and gullies. The soil was Manor, not the best or the worst. The land was rolling, bedraggled, tired.

Rice filled the gullies with brush and old logs, and soon could plow across them. First he tried corn. He figured he had too little land for pasture. He produced enough corn to fill three silos, and fed silage to his cows the year round.

Nineteen years ago Rice grew his last crop of corn. He went all out for pasture. He specialized in seedbed preparation, grass-legume mixtures, and fertilization. He was willing to spend money to make money. His methods attracted wide attention, and today he supervises 11 other farms besides his own. He cooperates with the Northern Virginia Soil Conservation District.

At first Rice favored a pasture of rye seeded to sweet clover. But he soon decided that he "didn't like sweet clover because the cows didn't." After that he tried, and rejected, many different mixtures.

In 1937 Rice made a 10-strike. Acting on a small news item, a casual inquiry and a hunch, he sent off to Oregon for 15 pounds of the new wonder legume, ladino clover. Ladino has been

Rice maintains there is no finer hay mixture for the eastern part of the country than orchard grass, alfalfa, and ladino clover.

NOTE.—The author told the same story, leaving out some of the details, in the August issue of *Country Gentleman*, which has kindly agreed to its use in SOIL CONSERVATION Magazine.

Rice examines new-mown grass cut by Farm Foreman T. M. Weeks. Seeding mixture on this field comprised orchard grass, alfalfa, and ladino clover.

Reseeding is done with disk. The heavy sod is disked, fertilized, and reseeded, keeping all roots and stubble on surface for mulch.

Care is exercised to make sure that the cutting does not get so far ahead of the pick-up and chopping operations that the grass will dry out lying in the field.

The grass silage these cows are so eager to get at has not lost any of its appeal after having been in the silo a year or more.

After the hay mixture has wilted precisely the right amount in the field it is picked up and hauled to the chopper at the silo.

After a field has served in rotation as a meadow the cows graze it until a predominance of bluegrass signals the time for reseeding.

a key part of his program ever since. He has some today that is 10 years old and still vigorous.

Rice uses four pet mixtures:

No. 1 consists of 2½ to 3 pounds of ladino clover, 3 pounds of red clover, 10 pounds of timothy.

No. 2 includes 7 pounds of orchard grass, 3 pounds of ladino clover, 4 pounds red clover.

No. 3 is made up of 15 to 20 pounds of alfalfa, 7 pounds of orchard grass, 2 to 3 pounds of ladino.

No. 4 supplies the earliest grazing: 20 pounds of domestic rye grass, 3 pounds of ladino clover, 3 pounds of red clover.

"Any or all of these make excellent silage when cut at the right stage and properly wilted," says Rice. "The timothy-clover mixture produces top quality hay at first cutting. The orchard grass-alfalfa mixture gives wonderful hay at second and third cuttings."

Why the heavy seeding of clover? To assure a quick, thick stand the first year, he explains.

Every 4 or 5 years, as legumes are crowded out by orchard grass and bluegrass, reseeding is indicated. All preparation is done by a cutaway disk harrow. A spring-tooth harrow is used to level the seedbed. Seeding itself is either by hand with a cyclone seeder or, in the case of the clover-alfalfa mixture, by drilling.

Each bit of pasture is fertilized annually, 600 to 800 pounds per acre. It is done in the fall. Rice uses whichever of these formulas is available: 2–12–12 or 0–12–12, or 3–12–6. He spreads lime every fifth year at the rate of 2 tons per acre.

The 70 acres are divided into 14 fenced lots for rotation grazing. The grazing season runs from April 1 to November 15. This year the cows were put on pasture March 29. Milk production jumped 15 gallons in 3 days—notwithstanding the well-balanced barn ration.

Rice begins with 5 acres of bluegrass which has remained in heavy sod and has been fertilized in January or February with 250 pounds of cyanamid per acre. The fertilizer steps up the grass so that it is ready to be pastured the first week in April—about 2 weeks earlier than the legume-grass mixtures. After that, the pastures which have not been used for silage are swung into rotation.

As soon as grazing ends in a pasture lot and the cows move off, the pasture is clipped to remove patches which have been refused.

Rice never allows his herd to spend an entire day or night on any fresh or succulent pasture. They are taken off just before dark and put in a bluegrass lot. They are not allowed to lie down and foul the pasture.

"I always attempt to leave 4 inches of growth at the end of the grazing season," says this wise farmer. "This lets the runners turn over and protect the plant through the winter."

Even in dry weather, plenty of pasture is available. There's not only *more* feed but *better*.

But Rice does not skimp his cows. He gives them 20 to 25 pounds of silage per day—all they will eat. He fills the troughs with all the hay they will consume twice a day. He gives them less grain than most dairy farmers, however—about half the amount they would reach for, with corn silage; 200 pounds for all 35 cows.

No calves are kept. They are sold at 4 days old to people not in the business of selling milk. By agreement, Rice may buy them back when fresh if he chooses. It's cheaper than raising them.

Rice sells hay while most dairymen are buying. He puts his investment—freely—where it will pay off. He feeds his land as well as his cows. He has no gullies, no soil losses. Seed, fertilizer, soil, and water stay home. His farm is a veritable emerald isle in the frequently brown countryside.

THE MORE LAND HE GETS

(*Continued from page 83*)

Southern Negroes are among the best customers for burial insurance because it is only through their policies that some of them can hope to have a fine funeral. A burial-insurance salesman approached one of the older Negro tenants, Joe Dillard, on the Yarbrough farm about burial insurance. The old Negro man said, "Naw, suh! I don't want no insho'ance. Cap'n gwi'n bury me."

Following this little story, Dave Yarbrough went a little further and gave me an insight into how he feels about his stewardship of this land and the people who live on it. He said, "These old people will always have a house, food, fuel, and someone to take care of them when they are sick." This simple, undramatic statement explains to some extent why tenants have remained with him since 1914. It also exemplifies a relationship that exists between countless Southern landowners and their tenants.

The landlord-tenant agreement in livestock production has been worked out to the satisfaction

of both. Yarbrough furnishes the brood sows, the land, the fences, and the power and equipment. Fertilizer and seeds are on a 50–50 basis and the proceeds from the sale of hogs are divided equally.

Beyond the boundaries of his own land, Dave Yarbrough is a man of influence. Young and middle-aged farmers, who in their own right are rather extensive operators, show great respect for what "Mr. Dave" thinks about any subject pertaining to farm problems or matters of business. Incidentally, I never heard him give any advice or information that was not sought. The older men of the county who have known him for many years simply call him "Dave" in that certain tone that old and trusted friends reserve for each other. This friendly relationship between Dave Yarbrough and his neighbors makes him an effective and influential supervisor in his local soil conservation district.

This story would not be complete without at least a brief mention of the late afternoon gathering at the Yarbrough home of neighbors and friends from adjoining farms, from Prattville and from Montgomery for a barbecue. I was spending the night at the Yarbrough home and was told that Mr. Dave was having a little barbecue for a few friends. The "few" grew into a crowd of about 75. After all had eaten their fill of delicious barbecue and Brunswick stew, prepared and served according to the best Southern tradition, enough meat was left to have caused the average town dweller to rent a freezer locker and put the meat away to carry him through the winter.

Peaches are produced commercially, most of them being sold on the Montgomery and Birmingham markets. Like everything else on this farm, peaches of high quality are produced. While I was visiting him, Dave Yarbrough showed more pride of accomplishment in the excellent growth the trees in a young peach orchard were making than in almost anything else in his big and varied farm operations.

Many additional pages could be written about such things as the high yields of cotton, corn, and other crops; the extensive use of power equipment; the excellent woodland management practices; and countless other phases of this extensive farm enterprise. Space does not permit detailed descriptions and this tale must approach an end.

Before ending, however, I must say something about future plans. Dave Yarbrough is one farmer who does not intend for the work of a lifetime to be turned over to strangers who will destroy it. His son, Harry, and a son-in-law, Lewis Avant, actively assist with the farm operation and it definitely is in the long-time plan for this farm to stay in the family. Both of these young men work in the fields, and an outside man is hired as bookkeeper.

When Yarbrough turns the farm over to younger hands, another generation will be coming along. Several fine young grandchildren are growing up on the farm. If family tradition is followed, these youngsters in their turn will learn the business from the ground up so that when their time comes to take over, they, too, will be ready.

Row crops on the Yarbrough farm are cultivated on contour with tractor equipment.

PACIFIC

Lush stand of Harding grass on Mitchell ranch last May. SCS technician Ralph V. Boatman (left), Dave Pennell, and L. Z. Mitchell, Corning, and H. E. Schroeder, Orland.

HARDING GRASS.—New hope for 60,000 acres of "threadbare" cattle and sheep range in the Corning Soil Conservation District in Tehama County, Calif., is seen in recent tests with a hardy Australian native perennial grass.

The lush, year-around greenness of the perennial from Queensland stamps it as a promising "replacement" for America's vanishing bunchgrass stand. Tested the last 4 years at the Pleasanton, Calif., nursery of the Soil Conservation Service, Harding grass, as it is called, has survived the toughest kind of trials. Seeded with subterranean clover, under actual range conditions, it has triumphed over natural and man-made obstacles.

Once the rolling foothills of the coastal ranges west of Corning were covered by verdant bunchgrass. Cattle and sheep grazed shoulder high. Stock fattened, and ranchers profited from the rich, unspoiled grassland. Meanwhile, ranchers went on boosting the size of their herds. They paid little heed to the wear and tear taking place.

The bunchgrass cover wore out. Bald patches soon grew section-wide. It didn't take long for the native perennial grasses to disappear, roots and all.

Stock raising today is far removed from the thundering herds of the bunchgrass era. Annuals have taken over the range. Only about half of the original range area around Corning is being grazed now. Good range is scarce.

Tehama ranchers have long sought ways to change the barren outlook. The successful tests with Harding grass came as welcome news. For, potentially, Harding grass is regarded by technicians as prime forage for more than 60,000 acres in the Corning district. Seeded to Harding and subterranean clover, the range land ought to be capable of doubling present carrying capacity.

Ranchers who attended a demonstration trial on the L. Z. Mitchell ranch, 10 miles west of Corning, got their first look at Harding grass. What they saw was a vigorous, drought resistant, soil binding perennial, a grass that will stand up well under heavy grazing. It is palatable and winter growing.

On the Mitchell place 30 acres were seeded, together with subterranean clover, in three test plots. The trial seedings made near Corning are the only ones made in the Central Valley of northern California. The site selected for the trial was a piece of stripped-down range, worn to a frazzle by overgrazing. It is a sample of the 600 acres of lost range which caused Mitchell to switch from cattle to turkeys a few years ago. He hopes to rebuild his range with Harding grass. Then he plans to go back into the cattle business.

Planting of the Harding perennial last November was preceded by a period of summer fallowing in the spring. The land was disced several times during the summer to control weeds and prepare the good seedbed which is so essential.

Harding grass in June, when the native annual range is brown and dry, is still green and succulent. It averaged 5 feet in height on Mitchell's plot in sharp contrast to the short, dried-up annual range nearby.

The long, blistering summers of California's interior valley pose a problem for range forage plants. Annuals which complete their life cycle before the long dry summers have fared best.

If Harding grass has any draw-backs, it is the initial cost of seeding. Seed runs about $10 per pound. About 4 pounds of Harding seed and 8 pounds of subterranean clover per acre are needed. Plowing, discing, seeding, and harrowing add another $10 to $15 to the bill. But as Mitchell points out, "Harding grass is like a brick house. Once you build it, it stays." This year, due to favorable rains, Mitchell thinks he will realize over $100 per acre from the harvesting of the seed crop.

The Corning staff of the Service is telling ranchers that Harding grass, with subterranean clover, is best suited to bald, overgrazed lands on favorable sites. Range specialists do not advise plowing up range with a cover of good annual forage plants, such as wild oats, bur clover, and cut-leaf alfilaria.

On this point, Hilton Taylor, in charge of the Corning office of the Service, says, "Here proper management is a more economical solution." He warns that overgrazing will cause the perennial Harding grass stands to disappear like the original perennial covers. He adds that proper management is even more essential on perennial than on annual ranges.—Herb Boddy.

SAVE THAT WATER!—A field check of mounting irrigation water losses, aimed at mending the "leaks" in 31,000 acres of intensely farmed cropland in Oregon's Deschutes and Crook Counties, moved into high gear this summer. The water-saving survey is being carried out under joint action of the Mid-State Soil Conservation District, the Central Oregon Drainage District, and the Soil Conservation Service.

Anton Winkel (left), SCS technician at Redmond, Oreg., and Olaf Anderson, manager of Central Oregon Irrigation District, make preliminary check of water loss in farm lateral ditch.

Findings of survey teams will form the basis of "stop gap" water-saving measures which the irrigation district will establish under an expanded maintenance program.

Preliminary checks already indicate that one-half of the district's irrigation water is being lost somewhere along the course of the flow, between river and crops. Total average transmission water losses between diversion points and farm field taps are estimated at 30 percent.

Equally startling is the report of mounting water losses in farm irrigation systems. Farms are using, on an average, 5.56 acre-feet of water as contrasted to 3.5 to 4.0 acre-feet, the estimated field requirements of existing crops.

Most water conveyance systems serving the 755-farm area consist of open, unlined canals and laterals, constructed in fairly shallow soil over lava beds. The district is on short water rations at least 2 years in every decade.

The current water-saving development is planned to insure wider use of irrigation water to farm lands in the Redmond, Alfalfa, and Terrebone communities. Behind the plan of the cooperating agencies, too, is the prospect for expansion of new farm land and changing over dryland farms to irrigation. There is also the aim of cutting water rental costs to the farmer. Irrigation leaders stamp the survey as one of the most important water-saving moves to be conducted in central Oregon.

SWEETCLOVER IN 4-YEAR CYCLE.—Sweetclover's part in the Latah and Nez Perce Soil Conservation Districts' current cereal-crop boom has farmers of that western Idaho grain center talking. High grain yields from farms using sweetclover is the rule. Harvests in the Genesee community gained an average of 20 percent in bushed production, following the use of sweetclover over fallow.

The generous praise farmers are heaping on the sturdy legume stamps it as one of Genesee's best soil-conservation practices. Higher crop yields from farms using sweetclover, along with other soil- and water-conservation measures, are reflected in the grain overflow from the local elevators. Several tons of the grain were stored on the ground after harvest time last year. Pioneer residents recall that once before Main Street buzzed in anticipation of bumper crops and stepped-up income. That was when farmers changed over from horsepower to tractors.

Already the seeding of sweetclover, or sweetclover seeded with grass or alfalfa, has spread over one-seventh of the cropland in Genesee section. District cooperators describe the sweetclover tie-in with their conservation program as ideal for stopping soil losses, building organic matter, and aiding moisture penetration. Sweetclover also puts needed nitrogen back in the soil.

For years, seeding sweetclover with peas in a 5-year cropping cycle has been the backbone of farming around Genesee. Today, many farmers are getting better crop yields from seeding sweetclover with barley in a 4-year rotation.

This field of Cornelius Sweeney, who farms near Genesee, Idaho, is seeded to sweetclover in alternate rows with barley.

James M. Rabdau, in charge of the Genesee SCS office, who outlined the 4-year cycle to farmers, sums up its benefits in this way:

Says he, "We believe a 4-year cycle is best for Genesee ranchers because they are farming in an area of low soil fertility. The 5-year rotation draws too heavily on the land's nitrogen supply.

"But there are many other reasons why farmers should shorten their rotations. The 4-year cycle controls weeds better. If farmers are pasturing sweetclover, they can graze the first year's growth in the fall. Barley is cut higher than peas and leaves more sweetclover top growth for forage. Peas are cut close to the ground, leaving little for pasture. When sweetclover is cropped low, a portion of it is lost and the remaining stand weakened. Farmers won't get a good tonnage from it the next year."

The higher barley stubble gives better snow control on slopes in the Genesee area, where organic matter is low, Rabdau points out. Erosion is usually heavy on unprotected fields. Sweetclover, seeded with peas, isn't holding the soil too well. But, the higher sweetclover-barley stubble conserves snow and protects the land from freezing.

Rabdau points out that the 4-year cycle permits farmers to sow other crops, as desired, and thus keep up with changing grain markets. No matter what grain crops are grown with sweetclover, in either the 4- or 5-year cycle, cereal-crop ranchers stand to gain a high level of production.

Marion Holben, a 4-year-cycle rancher, harvested a ton of barley on pea ground that he seeded with sweetclover. His peas went better than a ton per acre, following wheat on sweetclover ground. His wheat, on sweetclover ground, went 48 bushels of Rex and 56 bushels of Orfed per acre. Holben hasn't burned his stubble for more than 5 years. He uses all of it. He fall disks his grain stubble, then follows up with a rotary subsoiler.

Adrian Nelson, also following a 4-year rotation, got 50 bushels of wheat on sweetclover ground. His peas on wheat stubble went better than a ton and his barley on pea ground went more than a ton. Stubble hasn't been burned on his farm in years.

Rennie at left, "Doc" at right.

LEMON AID.—The sagging citrus fruit crop of R. R. Rennie, Granada Hills, Calif., rancher, is on the rebound today because of a $10 soil auger and a bit of know-how.

In moisture-thirsty San Fernando Valley citrus growers count heavily on irrigation water. The way they use it is the yardstick of their crop yields. The owners of many lemon, orange, and grapefruit orchards have learned the hard way that a water-laden field is not the key to bumper yields. The harvest records of many southern California orchards bear this out.

"We try to use just enough water to irrigate our ranches," explains a grower. "But it's easier said than done."

Rennie eyed his ebbing citrus box score uneasily a year ago. His lemon harvest dropped from 5,500 boxes in 1944 to 1,500. His orange and grapefruit crop skidded too.

Says Rennie, "I made the usual routine check of my orchard. Die-back was showing up more and more on my trees. I couldn't figure it out. Going over my furrow system, I found it in good working order. I was sure my trees were getting plenty of water."

Talking things over with his neighbors, Rennie learned they were in hot water, too. Whatever was wrong with his trees seemed to hit the lemons hardest. The heavy fall of leaves in his lemon grove was not only a heartbreaker for Rennie, but downright embarrassing.

Rennie did what many San Fernando Valley ranchers are doing. He laid his orchard problems before directors of the San Fernando Soil Conservation District. Technicians of the Soil Conservation Service moved to give a helping hand early this year.

Using a water probe and soil auger, "Doc" Cureton checked the moisture at several points in the orchard. Tapping the soils here and there, he found Rennie was putting too much water on light soils and not enough on heavy soils. The handy irrigation tools, valued at $10, showed the error.

"Rennie, you are watering too much and too often, and in the wrong places," "Doc" explained. "If you'll buy a soil auger and water probe, I'll show you how to use them. You can save your orchard."

Rennie became handy with the tools. It wasn't long till he was saving water daily. He has already saved $104 in water rent on 28 acres. The gain from good water use has cheered Rennie to predict that his orchard will be back to normal in 3 years. Leaf fall is light now. Die-back is easing off. The 1948 pick stacked up as the best in 4 years.

Says Rennie, "It's easy now to tell when to irrigate and how much water to put on, thanks to the help I got from the Service. What do I think of my soil auger and water probe? They are the most important tools I've got. I found it the best $10 I ever spent."

SOUTHWEST

THEY'LL KEEP CLOSE WATCH ON EROSION.—A New Mexico soil conservation district may soon have the distinction of an addition where all the farmers bear the same name.

Cundiyo, a Spanish-American village and farming community in Santa Fe County, has a long-standing tradition that all families in the community must bear the name "Vigil." The farmers of this valley, "where everyone is named Vigil," have recently petitioned to join the Pojoaque Soil Conservation District, according to W. A. Williams, Jr., chairman of the board.

PONDS POPULAR.—Thousands of acres of range land in the 5,560,000-acre Uintah Basin Soil Conservation District in northeast Utah are being improved by new stock ponds

and spring developments, according to Howard M. Ivory, district conservationist for the Soil Conservation Service.

Ivory reports 144 new ponds built by ranchers cooperating with the district. These developments of well-spaced water supplies are enabling ranchers to make better use of their range because livestock can get to water without trampling vegetation and walking off weight.

Many ranchers are getting supplies of fresh fish and plenty of recreation as a result of stocking their ponds with fish.

ABSORBING IDEA.—Blotters issued by the Bent Soil Conservation District, Colo., continue to create interest throughout the country.

Several months ago the Bent district began getting out a blotter for each 2-month period. The slick side of each issue carries a photograph of some local conservation scene, a calendar imprint for 2 months, a slogan or statement concerning soil conservation, and the district name and phone number in Las Animas.

KING COTTON QUENCHES THIRST.—Fred Favor, a cotton farmer in the Agua Fria Soil Conservation District, Ariz., is saving at least one-third on water and is getting cotton yields 500 pounds higher than the average of the Salt River Valley. He attributes this to the conservation plan he is following on his 480-acre Maricopa County farm.

His water saving has come through the lining of 4 miles of irrigation laterals and field ditches which formerly lost about one-third of the water pumped from Favor's wells. The water saved would irrigate an additional 60 acres of land. Converted to dollars and cents, this could mean an increased income of as much as $19,000. "If I'd lined the ditches 10 years sooner, I would be 20 years younger and quite a few dollars richer," Favor quips.

In addition to ditch lining, Favor also has leveled his land for uniform water distribution. This, plus rotation of alfalfa and cotton and the use of fertilizers, brings him a yield of 2 bales of cotton per acre—some 500 pounds higher than the average for the area.

FARM FIT FOR RACE.—"Fitting a Farm for the Future" is the euphonious tag placed on the big farm remodeling show in the West Arapahoe Soil Conservation District, September 18, under sponsorship of *Western Farm Life* and radio station KOA, both of Denver.

The farm chosen for this show contained range, irrigated land, and dry farm land, making it ideal as a show window for nearly every western soil conservation practice. Land leveling, irrigation improvements, terracing, stubble mulching, stock tank building, and gully diversions were the main practices.

In addition to the farm and range conservation work, planned and supervised by the Soil Conservation Service, farmstead improvements were handled by the Colorado Extension Service. The farmer, John Race, received a veritable jackpot of assistance from equipment and machinery dealers and other firms interested in the advertising possibilities of the event.

CONSERVATION CASH.—Five Colorado soil conservation districts will receive $500 cash awards in the first annual Soil Conservation Recognition Contest conducted by the *Denver Post* and radio station KLZ. The awards will be made in November.

Entries closed July 10 with 53 districts nominating three farms each, making a total of 159 farms entered in the competition. In conducting the contest, the State was divided into seven watershed areas. Regional judging was completed during July with six farms being selected to represent two districts in each of the seven watershed areas, making a total of 42 farms from which the State judging committee will select the five winners.

The office of each of the winning districts, in addition to the $500 cash, will receive a plaque for display on which will be inscribed the names of the district officers and the names of the farmers whose outstanding activities in soil and water conservation brought honor to the districts. All winning farmers will receive framed scrolls extolling their leadership in soil conservation.

REMADE AND RETOLD.—Arizona's first farm-in-a-day show, held in April, is still yielding results, according to word from the Oak Creek, Camp Verde, and Bridgeport Soil Conservation Districts, which sponsored the exhibition.

Supervisors and SCS personnel have been called on several times to take visitors over the farm that was remade in a day and the story was recently retold in the Sunday magazine section of the *Denver Post*.

LINING DITCHES.—Construction of a reinforced concrete ditch to take water across gravelly bench land and to prevent heavy losses by seepage has been started by the North Canyon Irrigation Co. in cooperation with the East Juab Soil Conservation District at Nephi, Utah.

This 1,000-linear-foot ditch will carry 11 second-feet of water, or about 4,950 gallons a minute.

This is the second project launched by this company within the past 2 years to conserve irrigation water. About 1,800 linear feet of metal flume was installed along this same canal last year.

In the past there have been heavy losses of water by seepage along the stream channel when the water got low during the irrigation season. This resulted in very little or no water reaching the cropland when it was most needed. Since these improvements have been made, farmers report they are getting a fair-sized stream.

It is planned to concrete-line a portion of the irrigation ditch each year so that eventually all of the water coming to the mouth of the canyon will reach the farm land. The company figures that water thus saved will more than pay for lining the ditch.

MORE AND BETTER RANGE.—"Proper clearing of undesirable sagebrush and the planting of western wheatgrass with yellow blossom sweetclover has increased the palatable range feed on my ranch by 500 percent," reports Paul Alire, a supervisor of the Lower Cebolla Soil Conservation District in Rio Arriba County, N. Mex.

"When the district was organized and began operations in 1944, there was considerable question as to whether sagebrush could be cleared profitably for the planting of improved grasses with clover," Alire recalls. "However, Soil Conservation Service technicians encouraged the early district cooperators to clear small tracts of sagebrush for grass plantings. Among those who adopted the program were Jose R. E. Martinez, H. C. Eubanks, G. C. Martinez, C. L. Jacobs, Hipolito Martinez, and myself. These ranchers, as well as myself, considered this a practical idea, but we did not expect the excellent results that have been obtained. Several tracts now are producing five times as much desirable pasture as did the sagebrush areas."

In view of the excellent results obtained, the district supervisors now are recommending that each ranch cooperator clear as much sagebrush from his land as is practical and plant pastures of improved grasses with clover.

Many sagebrush-infested ranches in this area now are producing at 20 percent of their capacity. "Money and effort spent in properly clearing sagebrush and planting improved grasses, along with proper range management, is a good investment," Alire holds. "The use of these conservation practices can make poor range land produce many times more good livestock feed annually."

NORTHERN GREAT PLAINS

FUN AND FOOD.—Making "fishing holes" of farm and ranch ponds is more popular now than ever in the Northern Great Plains region—North and South Dakota, Nebraska, Kansas, Montana, and Wyoming.

This is because men and kids still love to fish, and these ponds are the only fishing holes in many parts of the area.

To date, SCS technicians have helped nearly 3,300 soil conservation district farmers in this area to make their ponds good places for fish; 1,735 were stocked last year.

Not all ponds are good for fish. Depth of water is more important than size of pond. The pond must be deep enough to allow for evaporation, seepage, and the use of water by livestock, and still leave enough to enable fish to live through all extremes of weather.

In the northern part of the Northern Great Plains, a pond should go into the winter with at least 10 feet of water. This requirement tapers off somewhat as one goes south. But as one goes south, the hot period gets longer. If the pond is shallow, the water will be warmed through. It must be deep enough for fish to have cool water. Anything less than 8 feet is risky.

The heavy silt deposits in many ponds are making them unfit for fish. Muddying the water is a draw-back. Then as the silt settles to the bottom, it reduces the depth of the water. In most cases, the water was none too deep to begin with.

Where SCS technicians help develop farm ponds, care is taken to prevent silting. Wherever possible, the runoff to fill a pond is taken from grassland. But where the water must come from cropland, it is cropland that is conservation farmed. The runoff has little, if any, silt. It flows slowly through a grassed waterway. Thus, the water is clean for both livestock and fish, and the depth of pond is maintained.

Other steps, also, are taken to improve the pond and its surroundings. It is found desirable to fence the pond and pipe the water for livestock to stock tanks when this can be done.

Planting grass, shrubs, and trees around the ponds has had several good results. This vegetation further safeguards the pond against silting. It also attracts birds and other wildlife. As the trees grow up, they tend to shade the pond.

Certain ponds developed this way have reached the stage so that when one is fishing he has the feeling that he is in the wilds. It is shady and cool, even during hot weather, and the fishing usually is good.

Even with the best of ponds, the ratio of game fish and the fish they feed on may become lopsided. When this happens, restocking is usually in order. Excess fish can be removed by seining, but it is far handier to be able to drain the water out and restock when the pond has filled again.

Experience shows that with proper management farm ponds can furnish lots of fun and food for many people.

SOUND BUSINESS.—Eight years' experience with a partial conservation plan has reflected such good results that the Thompson Lumber Co. is now completing the plan for its farm near Vermillion, S. Dak., so that all land will be treated according to its needs.

This work is being done in cooperation with the Clay County Soil Conservation District.

The Thompson Lumber Co. farm has 240 acres. Part of its is upland along the Vermillion River and part is bottom land. Water erosion has been severe on the hill land and silting has caused much damage on the bottom. Production was low.

First work in conservation was done in 1939 and 1940 with the help of a CCC camp. Included were contour furrows on 20 acres of pasture, a 60-rod diversion terrace to protect bottom land, seeding of bromegrass on 50 acres of rough land, and a farmstead windbreak.

RIVER CONFINED.—Bringing 6 acres of brush-covered land into production and confining the Jocko River to one channel to check erosion have been accomplished by Bill Wilson near Dixon, Mont., as part of his conservation plan. He is in the Eastern Sanders County Soil Conservation District.

These 6 acres were cleared last fall with equipment rented from the district. This spring, the land was leveled for irrigation. The old river channels have been filled in and that land is also producing.

"Trees and brush were so thick that even grazing by livestock was impossible," Wilson said. "Now, 4 acres are being used for cultivation. It was seeded this spring to red clover with grain as a nurse crop.

"The other 2 acres have been seeded to Huntley mixture for irrigated pastures. And with the old river channels filled, that land is now being used for hay production and pasture."

Beside clearing and stream control work, Wilson has built a diversion ditch to protect his cropland from runoff from the hills. He also practices crop residue management, is improving his pastures, and has finished some drainage work.

CANTANKEROUS CUTTING CHECKED.—This is something a little different in the way of maintaining roadside ditches. It happened in Cloud County, Kans., alongside the Eldon Thorman farm near Aurora.

The road at this place goes down a rather steep grade to the bottom of a small valley. And so, of course, does the roadside ditch. The ditch gullied severely.

For a time, the rushing water was held in check with a set of "drops"—small dams of wood or concrete that are like stairs to let the water down—in the lower part of the ditch.

After a few years, though, the water cut around the drops and they had to be replaced. This was because too much water flowed down the ditch for them to handle. It was expensive. Early last year, it became apparent that the second set of drops must be replaced.

This time, County Engineer Clifford Palmquist called on the board of supervisors of the Cloud County Soil Conservation District for suggestions. Perhaps some of the water could be kept out of the ditch. Furthermore, Eldon Thorman was developing a conservation plan on his farm in cooperation with the district.

B. K. Geraghty, of the Soil Conservation Service, who had helped Thorman work out his conservation plan, looked the situation over. He suggested that a diversion terrace be constructed.

This terrace would take water out of the road ditch above the place where it was cutting and lead it across Thorman's land just above the farmyard, upstream to a place where it could be dumped with safety into the little creek that drains the valley.

Thus, the water from the roadside would have to move slowly to the place where it could be disposed of with safety. At the same time, it would furnish Thorman with a diversion terrace he needed to keep runoff from the hill above from flowing through the farmyard, where it had caused some trouble.

Thorman granted an easement to the county for the diversion. The SCS technicians laid it out. The county engineer had it built with county equipment.

The ditch worked like a charm, according to all concerned. Thorman pointed out that the terrace wasn't overtopped once during last year's heavy rains. The county engineer points to the saving in cost in meeting the problem and to the permanent nature of the improvement.

All in all, with the water being brought under control, this shows that sometimes the longest way around is best.

WESTERN GULF

NATURE UNCONQUERED.—In the little community of Forestburg in the Upper Trinity River watershed of Texas stands a stone memorial erected by the State in honor of the early settlers. It states:

Forestburg

> Established after the Civil War. In memory of its pioneers who battled with the Indians, endured hardships and conquered the soil that civilization might live.

The irony of this is that today Forestburg stands in the center of one of the most severely eroded countrysides of the United States. Gully and sheet erosion has washed away so much topsoil that many fields, no longer productive, have been idle for years. The population has decreased, once-fertile farms have been abandoned. Rural schools and churches are empty and falling into decay.

This is another example of the futility of trying to conquer the soil. Nature still remains undefeated. The pioneer settlers of Forestburg did their best. They helped to create a great State and a great Nation. They lacked the knowledge and the tools for conserving the soil through the proper treatment and use of the land. Were they alive today, it is reasonable to believe that instead of trying to conquer the soil, they would cooperate with Nature in trying to conserve it.

FIGHTS EROSION AND RATTLESNAKES.—Soil Conservationist Austin E. Klahn has learned how to throw a shovel like a spear or javelin. It's a useful skill, for Klahn works in a rattlesnake-infested area and his shovel throwing is a defensive act to save himself from a possibly fatal bite.

Klahn is in charge of the Land Utilization Projects in the Texas and Oklahoma Panhandles north of Dalhart. The projects consist of parcels of land that became so badly wind-eroded in the 1930 drought years that they were no longer productive. Idle and often abandoned, they were a continual threat to other land whenever the

wind blew. To protect the whole area, the government bought tracts of this wind-devastated land and turned them over to the Soil Conservation Service to control erosion and restore them to productive range.

Klahn lives with his wife and their daughters, Marie, 4, and Charlotte Ann, 1, at Land Utilization Projects headquarters. The place is miles from anywhere. Rattlesnakes are all around it. One has been found in the garage, another near Klahn's back porch. One day Klahn killed three of them in half an hour. Another time this year Klahn and three fellow workers, setting out poisoned bait for prairie dogs, killed 125 rattlers in one day.

Klahn has erected a snake-proof fence at his home to provide a safe play pen for his children. He has invested $14 in a serum that he keeps in the family refrigerator for emergency use. He has trained his dog to bark a warning but to keep a safe distance from the vicious rattlers. For his own protection, he depends on his sharp eye and deadly accuracy with the shovel.

It's a treat to see Klahn fire his shovel. He stands off at a safe distance, takes careful aim, and lets fly. The shovel flies through the air like a jet-propelled spear or javelin, neatly slices the rattler's head off and plunges upright into the earth so that he can retrieve it without stooping over in the grass where other rattlers might be waiting.

IMPROVED PASTURE, MORE MILK.—Quick cash dividends from soil conservation work have been obtained by B. Spears, operator of a dairy near Lake Charles, La.

With the aid of Eloi Primeaux, SCS technician working with the Gulf Coast Soil Conservation District, Spears planted Kobe lespedeza on a 75-acre pasture of Bermuda grass last April. Fertilized with 300 pounds of 0–14–7, the well-prepared seedbed quickly developed a fair stand of lespedeza despite a dry spring.

Two months after the planting, Spears turned 100 cows into the pasture. Within 4 days the cows were producing 30 gallons more milk and eating 100 pounds less feed a day than before going on the improved pasture. That all figures out to $22 or 30 cents an acre daily. With favorable weather, Spears is counting on the grazing lasting until October 15. Improvement of the pasture cost $16 an acre.

Spears is well pleased with the results, for he had come to the conclusion that it would be unprofitable because of high feed costs to continue to produce milk with grain and hay. He has limed another 75-acre pasture for a fall sowing of white Dutch clover and Dallis grass. In addition, he is spreading manure on a 70-acre pasture which will be improved soon with ryegrass. His aim is to get as close to year-round grazing as possible.

TEACHING THE BLIND.—Over and over, David O. Davis, of the Fort Worth office of the Soil Conservation Service, has told the story of the soil, its use and abuse, its protection and improvement.

Recently, however, Davis was asked to talk to a garden club for the blind. Lantern slides, charts, and photographs were useless. He had to develop aids that the blind could "see."

"I was particularly bothered about those who were born blind," Davis said. "I called back the lady who had asked for the talk and explained. She reminded me that people who have been blind a long time develop other senses much more than folks who can see."

Davis gathered samples of soil—sand, silt, clay, loam, and samples of parent material, and went to the meeting.

The blind hostess welcomed him at the door. The tail of a seeing-eye dog thumped the floor. The club members smiled a greeting.

"I tried to talk strictly about things that could be touched, smelled, tasted, or heard," Davis related. "The audience helped by nodding and smiling. Then I made a point which the audience plainly didn't get. I realized that I had made this point by smiling and the audience didn't see me smile. I tried again. Another point failed to click, and I found I had tried to make an illustration with my hand. Again I backed up. Afterward when the audience gathered about the table to feel and smell the soil samples, I could tell by their remarks that they understood."

It was one instance, Davis said, in which a word—the right word— was worth a thousand pictures.

UPPER MISSISSIPPI

REFORMATORY MOVE.—The Anamosa (Iowa) Journal reports: "Biggest single impetus to soil conservation in Jones County was approved by the State Board of Control in Des Moines.

"The 1,504 acres in the five State farms operated by the men's reformatory at Anamosa will go under a 100-percent soils conservation program.

"Board of Control approved conservation plans for the five State farms made by Oris H. Randolph, Jones County soils work unit conservationist. Plans were prepared by Randolph on recommendation of Warden Foss Davis and Verne E. Purcell, superintendent of the State farms at Anamosa."

SOUTHEAST

GAME WARDEN HELPS.—S. T. Hogan, a supervisor of the Monroe Soil Conservation District in Kentucky, invited Oscar Bryant, the game warden, to attend a supervisor's meeting. Because of the lively interest aroused, the warden has helped stock 50 ponds with fish and seed 3,000 feet of field borders with sericea lespedeza. He has held several community meetings, demonstrating proper methods of stocking ponds and seeding field borders. The Soil Conservation Service supplies the warden with a list of farmers wanting this help.

José Vincente-Chandler.

JOSÉ VISITS GEORGE.—What does a Soil Conservation Service technician talk about when he's presented to the King of England?

You guessed it. The topic is soil conservation.

The King, by the way, is well informed on the subject, according to José Vincente-Chandler, work unit conservationist of Barranquitas, P. R. In fact, the King "stated categorically that he considered it one of the most important problems in the world today."

Vincente was one of a group of 10 athletes from Puerto Rico who went to England to compete in the Olympic games. After the games, he was selected to represent Puerto Rico at a reception given by the King and Queen at Buckingham Palace. He had the honor of being presented to the Royal Family and of holding what he describes as "a very short conversation" with the King. But short or not, it was long enough to get on the subject of soil conservation.

It was the first time Puerto Rico had participated in the Olympic Games. The Puerto Rican group competed in boxing, shooting, and track and field events. With very little experience in competitions of this sort, they felt lucky to score four points when their bantam weight boxer placed third in his division. More than a third of the countries did not score a single point. Vincente placed seventh in the pole vault. He tied at 13 feet with the U. S. National Champion, Morcum, who was awarded sixth place as he had taken a fewer number of vaults.

"My outstanding impression of the Olympics was that basically all people of the world are the same and can get along if they are just given the chance to know each other," Vincente says. "I met people from almost all the 62 nations which took part, and their aspirations and ideas were surprisingly similar."

What most impressed him about the agriculture of England, he said, was the almost complete absence of stream bank erosion.

"All the stream banks seemed to be built up and protected," he reports. "From what little I could see of English farms, it seemed to me that they manage their forests and pastures correctly and in most cases practice good land use."

Vincente, who is a graduate of the College of Agriculture at Mayaguez, has been with the SCS since April 1943, except for a period of service in the Army during the war. He has an outstanding record not only as an athlete, but as a farm planner. During the 14-month period ending June 30, 1948, he wrote 164 farm plans in the Torrecillas and Sudeste Soil Conservation Districts. This is an average of 140 plans a year. During the same period, 23 percent of the planned practices were applied on these farms. Since these were 5-year plans, this represents virtually 100 percent application of the practices which were scheduled for that period.

In addition to his participation in the Olympics, Vincente, during the war, won the seventh Army pole-vaulting championship at Mannerheim, Germany, in July 1945; the European Theater of Operations championship (13 feet 2½ inches) at Nurnberg, and the International Invitation meet (13 feet) at Paris in September 1945. Competing for Puerto Rico at Barranquilla, Colombia, in December 1946, he won the Central American championship at 13 feet 1 inch, and at San Juan, Puerto Rico in April 1948, he set a new Latin American record of 13 feet 7 inches. This record has not yet been officially accepted by the Association.

PULPWOOD COMPANY AIDS DISTRICT.—A pulpwood company operating in the Perdido River Soil Conservation District in Florida makes the services of their four foresters available without charge to assist SCS technicians in woodland management with small landowners. The company supplied district cooperators with 1,000,000 trees for planting during 1947. It is now establishing an 8-acre nursery, at a cost of $10,000, to grow seedlings for district cooperators and other farmers.

A pulpwood company in the Richmond work unit of Georgia's Briar Creek Soil Conservation District helped get 750 acres of woodland marked and thinned properly. At the request of the SCS technician, this company furnished equipment and taught farmers how to mark the timber for selective cutting.

A LESSON LEARNED.—Whenever Leonard Bender of Warren County, N. C., needed sand for concrete work, he used to go to a road ditch in front of R. H. Paschall's farm. But one day there was no sand there. Bender's curiosity was aroused. He found terracing, contour tillage, vegetated waterways, and improved cropping practices on the surrounding farm land. Erosion had been reduced to such a point that sand no longer accumulated in the road ditch.

Bender decided to investigate the situation on his own farm where crops had been planted without regard to the contour, with rows running across the terraces. He found that where rows crossed terraces, and at the lower ends of the fields, they had completely filled with sand.

"A lesson has been learned," said Bender. He forthwith made application for a conservation plan with the Fishing Creek Soil Conservation District. He is now putting the plan into effect as rapidly as the practices can be applied.

TREE PLANTER SETS KUDZU.—George B. Mock, chairman of the board of supervisors of the Flint River Soil Conservation District, Ga., interested Dougherty County commissioners in buying a tree-planting machine. Although the machine arrived late, 50,000 pine seedlings were set with it, at a cost of $1 a thousand as the charge for the planter. Kudzu plants, also, were set with this planter faster, easier, and better than by any other known method, L. Vincent Davis, work unit conservationist, reports.

DRAINAGE SPEEDED.—Supervisors of the Hampton Soil Conservation District of South Carolina arranged with the Hampton County commissioners to buy and turn over to the district a dragline and a float for transporting it. The county also made available $1,000 as a revolving fund, and furnished a truck and driver to move the dragline and a bulldozer from job to job. The county is to be repaid at a rate of $4 for each hour the machine is operated. Proper drainage is badly needed and the Soil Conservation Service pioneered with the district in this field. Result: Ten miles of drainage canals excavated on seven cooperators' farms in the first 6 months the dragline was operated, at a cost to the cooperator of 15.5 cents a yard.

DISTRICT DEMONSTRATIONS PLANNED.—The plan of work for the Bolivar County Soil Conservation District in Mississippi, adopted by the commissioners in June 1948, provides for selecting a farm in each neighborhood to be used for demonstrating the objectives of the district program.

"After work has been started on these farms," the commissioners state, "future work, we hope, can be planned on a neighborhood groups basis, using the demonstration farms to the very best advantage. Community or neighborhood priorities of work will be determined on the basis of interest in conservation. . . . We plan to hold educational meetings in all neighborhoods while the demonstration farms are being planned so that as many farmers as possible can be acquainted with the objectives and plans of the district."

Similar plans are being carried out in some of the older Mississippi districts.

RESEARCH POINTERS

Prepared by J. H. Stallings

GRADING SUGARCANE FIELDS.—The cost of grading sugarcane fields to improve drainage has been reduced from about $30 to $9 per acre, reports I. L. Saveson, SCS research, Baton Rouge, La. At the same time, the increase in crop yield resulting from improved drainage was $50 for "plant" cane and $25 for first stubble cane. The cuts are graded, or crowned, so that the land slopes toward the lateral ditches on each side. The crowned areas are easier to cultivate and harvest, and can be worked after heavy rains when the ungraded areas are still too wet to work.

ORGANIC MATTER AND SOIL AGGREGATION.—The degree of subdivision of organic matter incorporated with soil has a very marked influence on the degree of aggregation produced, state T. C. Peele and O. W. Beale, SCS research, Clemson College, S. C. Crimson clover ground to pass a 0.5 mm. sieve was much more effective than similar material of 1-inch size in promoting aggregation.

EROSION AND NAVIGATION.—Eighty-five million cubic yards of sediment were deposited at the head of Chesapeake Bay between 1846 and 1938, claims L. C. Gottschalk, SCS research, Washington, D. C. The average depth of water over an area of 32 square miles was reduced by 2½ feet. Sedimentation caused the abandonment of many early American ports, as well as of dozens of once-great foreign ports.

Vast changes in rates of erosion brought about by man's deforestation and misuse of tributary watershed lands are contributing to the rapid siltation of harbors and waterways. Many of our major ports of today function only because of continuous and expensive dredging operations.

PUBLIC WATER SUPPLIES.—Soil erosion on the watersheds of public water supplies presents a most pressing problem, says Carl B. Brown, SCS research, Washington, D. C. A readjustment of land-use practices to reduce the wastage of farm lands resulting from accelerated erosion is needed. Although this appears to relate primarily to conservation of land resources, erosion greatly affects surface runoff, the regimen of streams, and finally all water uses. Soil erosion causes not only the siltation of reservoirs with resultant losses of storage capacity but pollution from soil erosion brings with it an added burden of water purification. This applies to both industrial and public water supplies and represents in the aggregate a serious economic loss to the public. Both of these erosion damages can be greatly reduced by the application of known methods of erosion control on farm lands.

POTATO VINE LIFTERS.—Vine lifters for use on tractors and sprayers, to prevent damaging potato vines at the time of cultivating and spraying were built and used successfully during the last season, notes Karol J. Kucinski, SCS research, Amherst, Mass. The lifters are simple and inexpensive to make. The main arms of the machine are made from ¾-inch round steel with ⅝-inch round steel being used for the hangers between the main arms of the lifters and the hydraulic lift. There is enough spring in the rods to make it possible for them to take considerable abuse due to irregularities in terrain. The vine lifter for the front tricycle wheel is suspended by clothesline, one end of which is tied to the hand-operated levers used in connection with cultivator attachment. The vine lifters for the tractor rear wheels are suspended from the arm usually carrying the cultivator and are operated hydraulically. The two vine lifters for the wheels of the spray rig are suspended from an arm which is operated by another lever which can be manipulated from the driver's seat by means of a cord. They are easily detached from the tractor at the end of the spraying operation.

PUBLIC LIBRARY
OCT 23 1948
DETROIT

U. S. GOVERNMENT PRINTING OFFICE: 1948